

CLAIMS

WE CLAIM:

1. A control valve in which a direct-moved shaft having one  
5 of two ends abutted against a diaphragm is direct moved according  
to deformation of the diaphragm so that a valve element provided  
on the other end of the direct-moved shaft is adhered to and  
separated from an opening edge of a passage, thereby controlling  
a flow rate of a fluid passing through the passage, the control  
10 valve comprising:

a first body enclosing the direct-moved shaft therein;  
a second body enclosing the diaphragm therein;  
a compressive elastic member deformed by compression when  
the second body is pressed against the first body; and  
15 a holder for holding the second body on the first body while  
the compressive elastic member is deformed by compression.

2. A control valve according to claim 1, further comprising  
an outer cylinder fitted with an outer face of the first body  
20 and having an open end, wherein the second body is fitted in the  
open end of the outer cylinder, and the holder is formed by  
projecting a part of the outer cylinder toward the second body  
side.

25 3. A control valve according to claim 1, wherein the  
compressive elastic member is a wave washer formed by corrugating  
an annular disc.

4. A control valve according to claim 2, wherein the compressive elastic member is a wave washer formed by corrugating an annular disc.

5 5. A control valve according to claim 1, wherein the direct-moved shaft includes another shaft extending through a center thereof, and said another shaft has both ends mounted on the first or second body so that said another shaft is direct-moved.

10 6. A control valve according to claim 2, wherein the direct-moved shaft includes another shaft extending through a center thereof, and said another shaft has both ends mounted on the first or second body so that said another shaft is direct-moved.

15 7. A control valve according to claim 3, wherein the direct-moved shaft includes another shaft extending through a center thereof, and said another shaft has both ends mounted on the first or second body so that said another shaft is direct-moved.

20 8. A control valve according to claim 4, wherein the direct-moved shaft includes another shaft extending through a center thereof, and said another shaft has both ends mounted on the first or second body so that said another shaft is direct-moved.

25 9. A control valve according to claim 1, wherein the direct-moved shaft is provided with a magnetic member and the first body is provided with a solenoid operatively associated with the magnetic member to generate magnetic force directed

axially with respect to the direct-moved shaft.

10. A control valve according to claim 2, wherein the direct-moved shaft is provided with a magnetic member and the first body is provided with a solenoid operatively associated  
5 with the magnetic member to generate magnetic force directed axially with respect to the direct-moved shaft.

11. A control valve according to claim 3, wherein the direct-moved shaft is provided with a magnetic member and the  
10 first body is provided with a solenoid operatively associated with the magnetic member to generate magnetic force directed axially with respect to the direct-moved shaft.

12. A control valve according to claim 4, wherein the  
15 direct-moved shaft is provided with a magnetic member and the first body is provided with a solenoid operatively associated with the magnetic member to generate magnetic force directed axially with respect to the direct-moved shaft.

20 13. A control valve according to claim 5, wherein the direct-moved shaft is provided with a magnetic member and the first body is provided with a solenoid operatively associated with the magnetic member to generate magnetic force directed axially with respect to the direct-moved shaft.

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14. A control valve according to claim 6, wherein the direct-moved shaft is provided with a magnetic member and the first body is provided with a solenoid operatively associated

with the magnetic member to generate magnetic force directed axially with respect to the direct-moved shaft.

15. A control valve according to claim 7, wherein the  
5 direct-moved shaft is provided with a magnetic member and the first body is provided with a solenoid operatively associated to generate magnetic force directed axially with respect to the direct-moved shaft.

10        16. A control valve in which a direct-moved shaft having one of two ends abutted against a diaphragm is direct-moved according to deformation of the diaphragm so that a valve element provided on the other end of the direct-moved shaft is adhered to and separated from an opening edge of a passage, thereby  
15 controlling a flow rate of a fluid passing through the passage,  
the control valve comprising:

            a first body enclosing the direct-moved shaft therein;  
            a second body enclosing the diaphragm therein;  
            an outer cylinder provided on the first body so that the  
20 second body is fitted in the cylinder, the outer cylinder including a cylindrical wall; and  
            a holder provided on the cylindrical wall of the outer cylinder for holding the second body disposed at any location in the outer cylinder.

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16. A control valve according to claim 15, wherein the direct-moved shaft includes another shaft extending through a center thereof, and said another shaft has both ends mounted on

the first or second body so that said another shaft is direct-moved.

17. A control valve according to claim 15, wherein the direct-moved shaft is provided with a magnetic member and the first body is provided with a solenoid operatively associated 5 with the magnetic member to generate magnetic force directed axially with respect to the direct-moved shaft.

18. A control valve according to claim 16, wherein the direct-moved shaft is provided with a magnetic member and the 10 first body is provided with a solenoid operatively associated with the magnetic member to generate magnetic force directed axially with respect to the direct-moved shaft.

19. A method of manufacturing a control valve in which a 15 direct-moved shaft having one of two ends abutted against a diaphragm is direct moved according to deformation of the diaphragm so that a valve element provided on the other end of the direct-moved shaft is adhered to and separated from an opening edge of a passage, thereby controlling a flow rate of a fluid 20 passing through the passage, the method comprising:

provisionally assembling first and second bodies together; positioning the second body so that the direct-moved shaft is operated while a predetermined fluid pressure is applied to the diaphragm; and

25 fixing the second body to the first body.